

Dette er en oversettelse av den fastsatte læreplanteksten. Læreplanen er fastsatt på Bokmål

Laid down as a regulation by the Norwegian Directorate for Education and Training on 8 January 2008 as delegated in a letter of 26 September 2005 from the Ministry of Education and Research pursuant to the Act of 17 July 1998 no. 61 relating to primary and secondary education (Education Act) Section 3-4 first paragraph.

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## Purpose

Remote operated vehicle operations (ROV) shall lay the foundation for practicing a vocation in servicing, repairs and maintenance of remote controlled submersible vehicles. Today's society needs remote controlled submersible vehicles mainly in the oil and gas sector, but also in increasing numbers in the fields of aquaculture, subsea environmental investigation, archaeological exploration, sea floor mapping, work with military equipment, collection and cleaning of environmentally hazardous waste and for hydropower and assignments related to energy distribution. Greater demands are being set for functionality, safety for personnel, protecting the outdoor environment and production and quality of underwater operations, because there are more and more subsea installations being submerged to ever greater ocean depths. Qualified ROV operators and safe and sure ROV systems are necessary to ensure these demands.

Learning in ROV studies shall promote an understanding of systems and equipment, holistic thinking, creativity, the ability to analyse, versatility, reorganisation skills and innovation. Learning in the subject shall also promote an understanding of safety and security, and the ability to see the consequences of choices related to environment, health and safety and the working environment. Learning in the subject shall contribute to the individual developing an awareness of the contribution ROV work has to oil and gas production, social economics and developments in high-technology. The subject shall contribute to giving the apprentice an increased awareness of environmental challenges at local, national and global levels related to better use of resources and sustainable development.

Learning in the subject shall emphasise mastery, reflection, insight and conscious choices related to operations, equipment, economic influences of the trade on local, national and global levels, and related to the outdoor environment. Current rules and regulations shall be central elements in learning. Learning in the subject shall promote independence and cooperation with others within the same field, and with other professional fields. Service-mindedness and the ability to communicate with clients, subcontractors, support personnel and colleagues shall be an important focus. Learning in the subject shall also emphasise precision, creativity and problem solving involved in performing work. Learning in the subject shall develop operational and technical competence that forms the basis for in-depth study and specialisation later in one's professional life of lifelong learning.

Training completed and passed in the subject will lead to a Trade Certificate. The professional title is ROV Operator.

## Structure

Remote Operated Vehicle Operations consists of two main subject areas. The main subject areas complement each other, and should be viewed in relation to one another.

### Overview of the main subject areas:

Year level	Main subject areas	
Vg3 / In-service training at a training establishment	Operations	Operation and maintenance

## Main subject areas

The main subject area *Operations* covers planning, executing and documenting remote operated vehicle operations. The main subject area also covers submersible vehicles with different applications, equipment, tools and aids for use during remote operated vehicle operations. Integrated in the main subject area is communication and interaction, EHS and quality assurance systems, navigation, maritime operations, risk assessment, the use of digital tools, and current rules and regulations.

The main subject area *Operation and maintenance* covers functions testing, taking measurements, troubleshooting, error rectification, keeping log books, control checks, maintenance and optimising mechanical, hydraulic, electrical, fibre optic and technical video systems. Integrated in the main subject area is mechanical, electrotechnical, electronic and computer work, hydraulic communication, the use of digital tools, quality assurance systems, risk assessments, internal control routines, safety, security, electrical safety and rules and regulations.

## Basic skills

Basic skills are integrated into the competence aims for this course in areas where they contribute to the development of and are a part of the basic subject competence. In Remote operated vehicle operations, basic skills are understood as follows:

*Being able to express oneself orally* in Remote operated vehicle operations involves discussing safety, professional solutions and planning with customers, colleagues, specialist and people from other disciplines. It is important to develop precise use of language and be able to communicate well so that misunderstandings and dangerous situations do not arise.

*Being able to express oneself in writing* in Remote operated vehicle operations involves planning, documenting and keeping log books for operations, maintenance, non-conformance and safe job analyses. It also involves communicating with support personnel, colleagues, superiors, clients and suppliers.

*Being able to read* in Remote operated vehicle operations involves understanding different kinds of written material for the trade, which ensures that work is always performed in line with current rules, regulations, directives and the client's specification of requirements. Examples of such texts can be: handbooks, equipment manuals, assembly guidelines, regulations, standards, work descriptions, data sheets and EHS procedures.

*Numeracy* in Remote operated vehicle operations involves planning, evaluating results from tests and measurements, and understanding the how electric, hydraulic and pneumatic circuits work and interact.

*Being able to use digital tools* in Remote operated vehicle operations involves searching for information, keeping logs, gathering data and communications, in addition to gathering documentation for troubleshooting and error rectification. Digital tools are also used for control systems, configuration and troubleshooting.

## Competence aims

### Operations

*The aims of the training are to enable the apprentice to*

- plan, carry out and document at least three different remote operated vehicle operations in cooperation with involved parties
- plan, carry out and document preparation, use and re-examination checks of ROV tools
- evaluate areas of risk, select procedures, follow guidelines and use safety evaluation tools
- use ROV equipment based on its opportunities and limitations, and evaluate the risk of injury with surrounding structures and own equipment
- plan, carry out and document lifting operations based on current regulations
- evaluate the consequences of and risks for emissions and contamination of the natural environment and implement necessary measures
- evaluate weather conditions and water currents and how these influence the operation

- elaborate on and be able to use means of communication, and describe risks of the use of these
- use different navigation tools and aids, and describe the difference between these
- plan, carry out and document data collection using different tools
- use and maintain system documentation
- carry out work in accordance with quality control and internal control routines
- evaluate the quality of own work and the quality of improvement measures
- use a professional and precise technical language in Norwegian and English about ROV systems and equipment when communicating with support personnel, colleagues and representatives from other disciplines and trades
- perform operations using ROV systems and appurtenant equipment in a professional and precise manner in accordance with current rules, standards, manufacturer technical documentation and internal company procedures
- document own learning and training in operations

## Operation and maintenance

*The aims of the training are to enable the apprentice to*

- plan, carry out and document functions testing of a ROV system and elaborate on how this works and how it all fits together with the complete ROV system
- plan, carry out and document retermination of lift cables
- plan, carry out and document termination of optical fibre and measuring in a fibre system
- plan, carry out and document the changing of hydraulic power packs
- plan, carry out and document the changing of thruster engines
- plan, carry out and document installation of manipulators
- plan, carry out and document maintenance based on current maintenance procedures
- plan, carry out and document repairs to electric, hydraulic and mechanical parts in a ROV system
- elaborate on how control and video systems work, and perform basic upgrades and modifications
- use error and non-conformance reports
- plan, carry out and document the splicing of subsea cables
- elaborate on and decide how to carrying out measures to hinder risks when working near high voltage systems
- perform risk assessments
- measure and do control checks on electrical and hydraulic sizes for ROV systems and appurtenant equipment, and evaluate the results
- plan, carry out and document troubleshooting of ROV systems and appurtenant equipment
- perform work according to current rules and procedures for electric, hydraulic and mechanical work
- handle chemicals according to current rules and regulations
- describe areas of use and carry out maintenance on EX equipment according to current rules
- elaborate on ground fault systems and overcharge protections
- evaluate and identify sources of electrical noise, and consider this when working with ROV systems and equipment
- control and maintain measurement systems for depth, direction, temperature, pressure, rpms, levels and quantities
- elaborate on how the ROV systems' electrical, electronic, computer-based and fibre optic subsystems work
- plan, carry out and document adjustments and optimisations of hydraulic components
- use a number of oiling and lubing equipment, and elaborate on the filtering process and its characteristics
- use a professional and precise technical language with support personnel, colleagues and representatives from other disciplines and trades
- describe the company's structure, organisation, distribution of responsibility, decision-making processes, work routines and your own place in the organisation
- describe the economic consequences of operational stops, system errors and damage to materials, consider this when working
- describe employer and employee rights and obligations according to current regulations
- elaborate on safety work, safety delegates and the organisation of employee representation

- document own learning and training in operations and maintenance

## Assessment

### Vg3 Remote operated vehicle operations

Provisions for final assessment:

Main subject areas	Provision
Operations Operation and maintenance	All apprentices shall sit for a Trade Examination, which is normally carried out over a period of six working days.

The provisions for assessment are stipulated in the regulations of the Norwegian Education Act.